Nortel Business Communications Manager 5.0

# Fault and Performance Management

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# New in this release

The information in this chapter applies to both the BCM50 and the BCM450 platforms running BCM 5.0.

This document contains information about the alarms and performance metrics supported in the BCM system in Release 5.0.

## Navigation

- Features (page 7)

## Features

This document contains information about the following features in Release 5.0.

### Fault management

You can view and manage alarms and SNMP traps on the BCM system. For more information, see Using the BCM fault management system (page 21).

### System metrics

You can view detailed information about the performance of the BCM and about the performance of system resources. For more information, see System metrics monitoring (page 33).

### Telephony metrics

You can view detailed information about the performance of telephony services on the BCM system. For more information, see Telephony metrics monitoring (page 41) .

### LED status

The LEDs on the BCM hardware provide information about the status of the system. For more information, see System LEDs reference (page 65).

### Alarms

This document provides a reference to alarms supported on the BCM system. For information about the alarm reference, see Alarm reference (page 67).



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# Introduction

The information in this document applies to both the BCM50 and the BCM450 platforms running BCM 5.0.

This document contains information about how to manage alarms generated by the BCM 5.0 system and administer alarm settings.

## Navigation


- Fault and performance management fundamentals (page 11)
- Using the BCM fault management system (page 21)
- Alarm Severity reference (page 31)
- System metrics monitoring (page 33)
- Telephony metrics monitoring (page 41)
- System LEDs reference (page 65)
- Alarm reference (page 67)





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# Fault and performance management fundamentals

The information in this chapter applies to both the BCM50 and the BCM450 platforms running BCM 5.0.

This section provides information about managing alarms generated by the system and administering alarm settings.

## Navigation


- BCM fault management scope (page 11)
- BCM alarms (page 12)
- Alarm administration (page 12)
- Alarm to email forwarding (page 16)
- Alarms and LEDs (page 18)
- SNMP traps manager for remote monitoring (page 18)
- Alarm configuration scope (page 19)


## BCM fault management scope

You can view and manage real-time alarms generated by the BCM system. Alarms arise from components that run on the system; these alarms indicate faults or informational conditions that may require resolution from the system administrator. Examples of alarm conditions include:

- a T1 circuit on the system is down
- an administrator stopped a service that runs on the BCM

You can receive alarm information through any of the following means:

- the Alarms Panel in the Business Element Manager
- the Alarm Banner in the Business Element Manager
- Simple Network Management Protocol (SNMP) traps for remote management of faults




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- email notification - alarm email notification can be per alarm or based on alarm severity

You can manage alarms and alarm information by:

- configuring alarm settings, for example, filter alarms so that only the desired subset of alarms display in the Business Element Manager Alarms Panel are sent as SNMP traps
- administering alarms, for example, acknowledge selected alarms and clear the alarm log
- email notification, for example configuring settings so you receive notification about all critical alarms

## BCM alarms

Software components that run on the BCM system generate alarms related to BCM services and applications.

Each component includes a range of alarm IDs, so each BCM alarm retains a unique alarm ID.

### Alarms and log files

The system logs all alarms that appear in the Business Element Manager Alarms Panel in the alarms.systemlog file. This file is capped at 1 MB in size; when the file reaches this size, the system creates a new alarms.systemlog file. The BCM keeps the current file as well as three previous files. A new file starts when the BCM system reboots.

You can retrieve the alarms.systemlog files (the current file and the three previous files) from the BCM system using the Log Management task in the Business Element Manager. You can view the files using the BCM Log Browser. For more information, see the *BCM 5.0 Administration and Security Guide* (NN40170-603).

### Alarm severities

By default, all major and critical alarms are visible on the alarm set, sent as email or SNMP traps. Most, but not all alarms are visible in the Business Element Manager Alarm Panel. When BCM raises a Critical, Major, Minor and Warning alarm, this is reflected in the Alarm Banner.

## Alarm administration

Alarm information can be delivered to you by any of the following means:

- on a table on the alarms panel
- email notification



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- on the alarm banner on the bottom right corner of the Business Element Manager
- on the alarm set

### Alarms and the Alarms Panel

You can view real-time alarm information using the Alarms Panel in the Business Element Manager. Each alarm has a unique identifier. Alarms are displayed in the Alarms table, sorted by date and time by default, with the newest at the top of the table. The Alarms table displays from 100 to 1000 alarms. For information about setting the number of alarms that are displayed, see Configuring the alarm set (page 24). The Alarms table contains the following elements:

- Time — the date and time of the alarm
- Alarm Acked — indicates whether the Business Element Manager has acknowledged the alarm.
- Alarm ID — the unique alarm ID associated with the alarm
- Severity — the severity of the alarm (Critical, Major, Minor, Warning, and Information)
- Problem Description — a description of the alarm condition
- Component ID — the process that has generated the alarm, in a 3-part DN format. The component ID always identifies the system as a BCM, includes the name of the system that generated the alarm, and identifies the component that generated the alarm. In this way, remote monitoring stations can easily identify what type of system generated an SNMP trap and which system generated the trap.

When you select an alarm in the table, an Alarm Details pane is displayed for the selected alarm. The Alarm Details pane displays the following information:

- Time — the date and time of the alarm
- Problem description — a description of the alarm condition
- Problem resolution — the course of action for the alarm

You can acknowledge an alarm to indicate that you are troubleshooting an alarm. You can specify whether to include acknowledged alarms in the Alarm Banner so that the alarm count remains concise.For more information about the Alarm Banner, see Alarm banner (page 14).The alarm list in the Business Element Manager remains after BCM reboots.



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## Alarm banner

You can use the Alarm Banner in the Business Element Manager to view current alarm counts and recent alarm activity on the BCM system. The Alarm Banner appears on the bottom-right corner of the Business Element Manager window. The Alarm Banner is visible at all times, so you do not have to navigate to the Alarms Panel to view alarms. If you notice a change in alarm conditions in the Alarm Banner — for example a red spike in the Critical category — you can navigate to the Alarms Panel to view the actual alarm.

**Alarm banner**

The Alarm Banner provides counts of Critical, Major, Minor, and Warning alarms; Information alarms are not included. You can specify whether to include acknowledged alarms in the Alarm Banner.

Each alarm severity counter has a graph, which represents a data sample of the last 20 polling intervals. The system polls for new alarms every 30 seconds by default. The graph has a color to indicate a data change. The colors are as follows:

**Table 1 Alarm graph colors**

| Color | Indicates |
|---|---|
| Green | There are no alarms of this severity, or there are alarms of this severity but the count has decreased since the last polling interval. |
| Yellow | There are alarms of this severity, but they are older than at least one polling interval. |
| Red | A new alarm has occurred since the last polling interval. |

If you clear the alarm log from the Business Element Manager, the alarms displayed on the Alarm Banner are also cleared and reset to 0.



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## Alarm set

You can view critical and major alarms on a telephone set on the BCM system. This allows a system administrator to monitor alarm activity without having a Business Element Manager and a personal computer.

You can specify the telephone to serve as the alarm set in the Business Element Manager. The telephone set used for alarms must have a 2-line display and three soft keys.

The alarm set displays an alarm as follows:

XXXXX-YYYY

Where XXXXX is the alarm ID and YYYY is additional alarm information.

The following options are available when an alarm is sent to the alarm set:

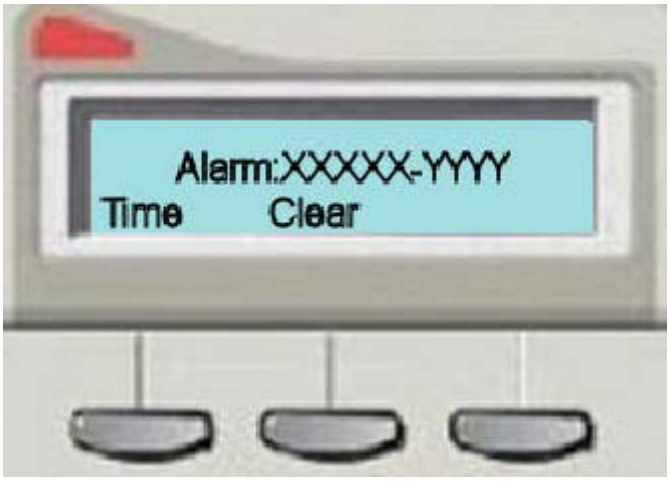
- Time — indicates the date and time when the alarm occurred
- Clear — use this soft key to remove the alarm from the alarm set

**Attention:** Clearing an alarm from the alarm set does not change the status of alarms on the Business Element Manager or reset the LEDs on the front panel of the unit.

**Attention:** When an alarm is displayed on the alarm set, it remains visible until you clear the alarm by using a softkey on the alarm set. More recent alarms are not be displayed until the current alarm is cleared on the alarm set.

The following figure shows an example of an alarm on the alarm set.

**Figure 1 Alarm set alarm**



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## Alarm to email forwarding

You can forward alarms to email and use the email forwarding option to

- monitor alarms on the BCM
- forward alarms to a third party for the BCM support

Destinations you have provisioned to receive alarms have the following parameters:

- variable number of TO recipients
- variable number of CC recipients
- From field
- Simple Mail Transfer Protocol (SMTP) server field that can be IP address or hostname
- SMTP port
- option to enable Transport Layer Security (TLS)
- option to enable authentication
- user name and password for SMTP authentication

The following alarm details are included in the alarm email notification:

- title
  - hostname
  - alarm severity
  - alarm ID
- email body
  - date of alarm
  - alarm ID
  - alarm severity
  - alarm description
  - alarm resolution

Use the Test Alarm feature in the Business Element Manager to test the settings.

If any of the destinations do not successfully receive the email, the alarms are not retransmitted. To view the alarms, log into the Business Element Manager or download the alarm.systemlog.



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Emails are not sent under the following conditions:

- network failure between the BCM and the SMTP server
- invalid SMTP server address or SMTP port
- conditions causing the SMTP server to reject the email including wrong TO address, wrong FROM address, or incorrect user ID and password details

## Alarm profile

An alarm profile simplifies alarm management by automatically enabling or disabling alarms in bulk based on their severity. This can be done for each supported alarm destination. BCM supports five profiles, as detailed in Table 2.

The BCM supports the following alarm destinations:

- Business Element Manager alarm list — viewable in the alarm panel of the Business Element Manager
- Email — alarm is sent as an email to any provisioned destinations
- SNMP — alarm is sent as a SNMP trap to any configured trap receivers
- Alarm set — alarm is sent to the BCM designated telephone set

See Table 2 for details on the alarm profile types.

To refine alarms that should be sent to a specified destination, select the alarm profile name and the alarm destination, and then apply settings. For more information about selecting an alarm profile, seeNotify and select an alarm profile (page 26).

**Table 2 BCM alarm profiles**

| Profiles | Description |
|---|---|
| Critical | Any alarm in this category has critical alarm designation. |
| Critical and Major | This category has critical and major alarm designation. |
| Critical, Major and Minor | Any alarm in this category has critical, major or minor alarm designation. |
| All | All possible alarms. |
| None | - |



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## Alarms and LEDs

When an alarm condition occurs on the system, the Status LED on the front of the BCM main unit, changes to reflect the alarm condition. In normal operation, both LEDs are green. All alarms with a severity of Major and Critical change the Status LED to solid red, except in the event of a Failed Startup Profile, which is indicated by a flashing red LED.

Using the Business Element Manager, you can reset the Status LEDs on the front pane of the BCM 5.0 to a normal state.

**Attention:** Once the Status LED has changed to red in response to a Critical or Major alarm condition, it remains in the alarmed state until you reset it using the Business Element Manager.

For information about LEDs and what they indicate, see System LEDs reference (page 65).

## SNMP traps manager for remote monitoring

You can use an SNMP trap manager to remotely monitor BCM alarms via SNMP traps. A trap is an indication from the BCM system to configured trap managers that an alarm has occurred in the BCM system. Any BCM alarm can generate an SNMP trap.

If you want the BCM to send SNMP traps, you must first configure the SNMP agent using the Business Element Manager. You must enable an SNMP agent and then configure how the system handles SNMP trap notifications. For information about configuring SNMP settings, see Enabling or disabling SNMP traps for alarms (page 26).

The BCM system uses the Small Site Events Management Information Base (MIB) for alarms. The trap format is specified in this MIB. You capture and view traps using any standard SNMP fault monitoring framework or trap watcher.

By default, the BCM sends SNMP traps for alarms with a severity of Major and Critical. You can change the default alarms that are set for SNMP to limit the volume and type of SNMP information, and to control essential information that is transferred on the network. For information about how to change the default alarms, see Configuring the alarm set (page 24).



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## Alarm configuration scope

Although the BCM system provides a default mapping of alarms that are displayed in the Alarms table and that are sent as an SNMP trap, you may want to monitor additional alarms using either of these means, or you may want to reduce the number of alarms that are displayed in the Alarms table or sent via SNMP traps.You can specify how each alarm is handled, according to your business requirements.

You can specify the following settings for alarms:

- the maximum number of alarms displayed in the Alarms Panel (from 100 to 1000)
- whether to enable or disable SNMP traps for selected alarms; by default, the system sends all Critical and Major alarms as SNMP traps if you specify one or more trap destinations
- whether to display selected alarms in the Alarms table; by default all Critical, Major, Minor, and Warning alarms are displayed in the Alarms table
- whether to display selected alarms on the alarm set; by default, only Critical and Major alarms are sent to this set

You can also test a selected alarm. This allows you to test whether the LED or SNMP traps are functioning as expected. Testing an alarm generates an alarm in the system. Alarms generated using the Test Alarm feature are identified in the Alarms table by the words “Test Event” in the alarm Problem Description field.

For more information about using SNMP to monitor your system see, the *BCM 5.0 Configuration—Telephony Guide* (NN40170-502).



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# Using the BCM fault management system

The information in this section applies to both the BCM50 and the BCM450 platforms running BCM 5.0.

This section describes how to manage alarms generated by the BCM system and administer alarm settings.

### Using the BCM fault management system navigation


- Administering alarms (page 21)
- Using the alarm banner (page 24)
- Using the alarm set (page 24)
- Responding to LED indicators (page 25)
- Configuring alarm behavior (page 25)
- Notify and select an alarm profile (page 26)
- Configuring an email (page 28)


## Administering alarms

This section contains information on the following topics:


- Monitoring an alarm condition (page 22)
- Acknowledging an alarm (page 22)
- Clearing the alarm log (page 23)





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## Monitoring an alarm condition

Use the following procedure to monitor an alarm condition.

### Procedure steps

| Step | Action |
|---|---|
| 1 | Click the **Administration** tab. |
| 2 | Open the **General** folder, and then click the **Alarms** task.<br>The Alarm page opens. |
| 3 | In the **Alarms Panel** table, select an alarm.<br>The Alarm Details pane displays below the Alarms table. |
| 4 | To change the order of columns in the Alarm table, select a column and drag it left or right to the desired location, and release it. |
| 5 | To view a column by ascending or descending order, click the column heading. |
| 6 | To sort columns, right-click a column heading.<br>The Sort dialog box opens. |
| 7 | Sort columns as required, and then click **OK**. |
| 8 | The columns in the **Alarms** table are sorted according to your specifications. |

**--End--**

## Acknowledging an alarm

Use the following procedure to acknowledge an alarm.

### Procedure steps

| Step | Action |
|---|---|
| 1 | Click the **Administration** tab. |
| 2 | Open the **General** folder, and then click the **Alarms** task.<br>The Alarms pane opens. |



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| | |
|---|---|
| **3** | In the **Alarms** table, select the alarm you want to acknowledge.<br>The Alarm Details pane is displayed below the Alarms table. |
| **4** | On the **Alarms Details** pane, click the **Acknowledge Alarm** button.<br>A check box appears in the Alarm Acked column in the Alarms table for this alarm. |

**Attention:** Acknowledging the alarm does not clear the alarm; it indicates only that you have noted it.

**--End--**

## Clearing the alarm log

Use the following procedure to clear the alarm log.

### Procedure steps

| Step | Action |
|---|---|
| **1** | Click the **Administration** tab. |
| **2** | Open the **General** folder, and then click the **Alarms** task.<br>The Alarms pane opens. |
| **3** | On the **Alarms** pane, click the **Clear Alarm Log** button.<br>The Alarms table is cleared. You will be able to see all new alarms only after the next alarm polling interval. |

**--End--**



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# Using the alarm banner

Use the alarm banner to view current alarm counts and recent alarm activity on the BCM system.

## Including or omitting acknowledged alarms in the Alarm Banner

Use the following step to include or omit acknowledged alarms in the Alarm Banner.

### Procedure steps

| Step | Action |
|---|---|
| 1 | Select or clear the **Include Acked Alarms** check box in the Alarm Banner. |

**--End--**

# Using the alarm set

Use the alarm set to monitor alarm activity without having a Business Element Manager and a personal computer.

## Configuring the alarm set

Use the following steps to configure the alarm set.

### Procedure steps

| Step | Action |
|---|---|
| 1 | Click the **Configuration** tab. |
| 2 | Open the **Telephony** folder. |
| 3 | Open the **Global Settings** folder, and then click the **Feature settings** task.<br>The Feature Settings page opens. |
| 4 | In the **Feature Settings** area, enter the DN of the telephone set that you want to use for the alarm set in the **Alarm Set** field. |

**--End--**



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### Clearing an alarm from the alarm set

Use the following step to clear an alarm from the alarm set.

#### Procedure steps

| Step | Action |
|---|---|
| 1 | On the alarm set, press the **Clear** soft key. The alarm is cleared from the alarm set. |

**--End--**

## Responding to LED indicators

Use the Business Element Manager to reset the Status LEDs on the front panel of the BCM to a normal state.

### Reset the status LED

Use the following steps to reset the status LED.

#### Procedure steps

| Step | Action |
|---|---|
| 1 | Click the **Administration** tab. |
| 2 | Open the **General** folder, and then click the **Alarms** task.<br>The Alarms pane opens |
| 3 | On the **Alarms** pane, click the **Reset LEDs** button.<br>The Status LED on the front panel of the BCM is reset from red to normal operation green. |

**--End--**

## Configuring alarm behavior

Configure alarm behavior to specify the following settings for alarms:

- the maximum number of alarms to display in the Alarms Panel (from 100 to 1000)
- whether to enable or disable SNMP traps for selected alarms; if you have specified an SNMP trap destination, by default you will receive all Critical and Major alarms



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- whether to display selected alarms in the Alarms table; by default all Critical, Major, Minor, and Warning alarms are displayed in the Alarms table
- whether to display selected alarms on the alarm set; by default, only core telephony Critical and Major alarms are sent to this set
- use email forwarding

### Notifying and selecting an alarm profile

Use the Alarm Setting panel to select the Notification Type which describes where the alarm will be presented and Profile Selection which selects an alarm profile.

## Notify and select an alarm profile

Use the following procedure to select a Notification Type and an Alarm Profile.

| Step | Action |
|---|---|
| 1 | Click on the **Administration** tab. |
| 2 | Open the **General** folder, and then click the **Alarm Settings** task.<br>The Alarm Settings panel opens. |
| 3 | Select the **Notification Type** that you want from the list. |
| 4 | Select the **Profile Selection** that you want from the list. |

**--End--**

### Enabling or disabling SNMP traps for alarms

Use the following procedure to enable to disable SNMP traps for alarms.

#### Procedure steps

| Step | Action |
|---|---|
| 1 | Click the **Administration** tab. |
| 2 | Open the **General** folder, and then click the **Alarm Settings** task. |



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| | |
|---|---|
| 3 | In the **Alarm Settings** table, select an alarm. |
| 4 | In the **Enable SNMP Trap** column, select or clear the check box to enable or disable SNMP traps for the selected alarm. If you select the check box for a selected alarm, an SNMP trap will be generated if that particular alarm condition occurs. |

**--End--**

## Enabling or disabling monitoring for selected alarms

Use the following procedure to enable or disable alarms.

### Procedure steps

| Step | Action |
|---|---|
| 1 | Click the **Administration** tab. |
| 2 | Open the **General** folder, and then click the **Alarm Settings** task.<br>The Alarm Settings pane opens. |
| 3 | In the **Alarms Settings** table, select an alarm. |
| 4 | In the Enable GUI View column, select or clear the check box to enable or disable a view of the selected alarm in the Alarms Panel. If you clear the check box for a selected alarm, the alarm will not be displayed in the Alarms table if that particular alarm condition occurs in the system. |

**--End--**

## Monitoring settings for the alarm set

Use the following procedure to monitor settings for the alarm set.

### Procedure steps

| Step | Action |
|---|---|
| 1 | Click the **Administration** tab. |
| 2 | Open the **General** folder, and then click the **Alarm Settings** task.<br>The Alarm Settings pane opens. |



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| | |
|---|---|
| 3 | In the **Alarms** table, select an alarm. |
| 4 | The **Enable Alarm Set** column indicates whether the alarm will display on the alarm set. |

**--End--**

### Testing an alarm

Use the following procedure to test an alarm.

#### Procedure steps

| Step | Action |
|---|---|
| 1 | Click the **Administration** tab. |
| 2 | Open the **General** folder, and then click the **Alarm Settings** task.<br>The Alarm Settings pane opens. |
| 3 | In the **Alarm Settings** table, select an alarm. |
| 4 | Click the **Test Alarm** button.<br>In the Alarms table, “Test Event” is displayed in the alarm Problem Description field. |

**--End--**

## Configuring an email

Use the Email Setting panel in the Business Element Manager to set and retrieve the SMTP settings.



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## Adding, modifying, and deleting an email account

Use the following procedure to add, modify, or delete an email account.

### Procedure steps

| Step | Action |
|---|---|
| **1** | Click on the **Configuration** tab. |
| **2** | Open the **Administration Access** folder, and then click on the **Email Settings** task.<br>The Email Settings panel appears. |
| **3** | To add an email account, click the **Add** button.<br>The Add Account panel appears. |
| **4** | Configure the **Add Account** parameters. |
| **5** | Click **OK** to add an email account. |
| **6** | To modify an email account, select an email account that you want to modify. |
| **7** | Modify the attributes by clicking the **Modify** button. |
| **8** | To delete an email account, select an email account that you want to delete. |
| **9** | Click the **Delete** button. A confirmation message appears. |
| **10** | Click **Yes** to confirm to deletion. |

**--End--**



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### Variable definitions

| Variable | Value |
|---|---|
| SMTP server | Hostname or IP address of SMPT server |
| SMTP port | The port for the SMPT server |
| | Default is 25 |
| To address | A series of email addresses separated by comma that the mail will be sent to |
| CC address | A series of email addresses separated by comma that the mail will be CC'ed to |
| From address | The email address the alarm will be sent from |
| | Default is bcm5.0@nortel.com |
| Use encryption | Select Use encryption check box to enable TLS encryption |
| | Default is disabled |
| SMTP authentication | Select SMTP authentication check box to enable SMTP authentication |
| | Default is disabled |

## Enabling or disabling forwarding of alarms

Use the following procedure to enable or disable forwarding of alarms to the SMPT destinations.

### Procedure steps

| Step | Action |
|---|---|
| 1 | Click on the **Administration** tab. |
| 2 | Open the **General** folder, and then click the **Alarm Settings** task.<br>The Alarm Settings panel opens. |
| 3 | In the **Alarms Settings** table, select an alarm. |
| 4 | In the **Enable Email** column, select or clear the check box to enable or disable forwarding of alarms. If you clear the check box, the email is not sent to the selected SMTP destination. |

**--End--**



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# Alarm Severity reference

The information in this section applies to both the BCM50 and the BCM450 platforms running BCM 5.0.

This section contains information about Alarm Severities, default mapping of security levels, and Alarm graph colors in the Business Element Manager.

## Navigation


- Alarm Severities (page 31)
- Default mapping of severity levels (page 31)
- Alarm graph colors in the Business Element Manager (page 32)


## Alarm Severities

Alarm severities are as follows:

**Table 3 Alarm severities**

| Alarm Severity | Description |
|---|---|
| Critical | Immediate corrective action is required due to conditions such as loss of service, loss of bandwidth, outage, loss of data, and/or functionality |
| Major | Urgent corrective action is required due to conditions such as pending loss of service, outage, loss of data, and/or functionality |
| Minor | Corrective action is required to prevent eventual service-affecting degeneration |
| Warning | Indicates the detection of a potential or impending service-affecting condition and that some diagnostic action is required |
| Information | Indicates audit-type information, such as configuration changes |

## Default mapping of severity levels

Use the following table to view the default mapping of each severity level against the Alarms Panel, alarms set, LEDs, and SNMP.




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**Table 4 Default mapping of severity levels**

| Alarm Severity | Alarms Panel | LEDs | SNMP | Alarm Set (core telephony alarms only) | Email forwarding |
|---|---|---|---|---|---|
| Critical | Yes | Yes | Yes | Yes | Yes |
| Major | Yes | Yes | Yes | Yes | Yes |
| Minor | Yes | No | No | No | Yes |
| Warning | Yes | No | No | No | No |
| Information | Yes | No | No | No | Yes |

## Alarm graph colors in the Business Element Manager

Use the following table to view alarm graph colors in the Business Element Manager.

**Table 5 Alarm graph colors in Business Element Manager**

| Color | Indicates |
|---|---|
| Green | There are no alarms of this severity, or there are alarms of this severity but the count has decreased since the last polling interval. |
| Yellow | There are alarms of this severity, but they are older than at least one polling interval. |
| Red | A new alarm has occurred since the last polling interval. |



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# System metrics monitoring

The information in this section applies to both the BCM50 and the BCM450 platforms running BCM 5.0.

You can use the Business Element Manager to view detailed information about the performance of the BCM and about the performance of system resources. This chapter provides procedures for monitoring quality of service (QoS) and other system metrics.

Using the Business Element Manager, you can monitor overall system performance and other performance-related information.

You can monitor system metrics using the following tools:

- QoS Monitoring
- UPS Status
- NTP Metrics

This section contains information on the following topics:


- QoS Monitoring (page 33)
- UPS metrics (page 37)
- NTP metrics (page 38)


## QoS Monitoring

QoS Monitor monitors the quality of service (QoS) of IP trunk services. The tool periodically monitors the delay and packet-loss of IP networks between two peer gateways. The main objective of the QoS Monitor is to allow new IP telephony calls to fall back to the PSTN if the voice quality of the IP network falls below the specified transmit threshold.

For information about setting the transmit threshold, see *Nortel Business Communications Manager 5.0 Configuration—Telephony* (NN40170-502). You can set the threshold in the Business Element Manager in the Telephony Resources panel.




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## QoS system metrics monitoring procedures

This task flow shows you the sequence of tasks you perform to monitor QoS statistics on the BCM system. To link to any procedures, click on QoS system metrics monitoring procedures navigation (page 34).

**Figure 2 QoS system metrics monitoring procedures**

## QoS system metrics monitoring procedures navigation

- Configuring the QoS monitor (page 35)
- Configuring QoS logging attributes (page 35)
- Viewing QoS logs (page 36)



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## Configuring the QoS monitor

You configure the QoS Monitor using the QoS Monitor panel on the Administration tab. You can configure the following:

- the monitoring mode
- logging parameters

### Procedure steps

| Step | Action |
|---|---|
| 1 | Click the **Administration** tab. |
| 2 | In the Navigation tree, click **System Metrics >QoS Monitor**. |
| 3 | From the **Monitoring Mode** drop-down menu, select a monitoring mode. |

**--End--**

**Table 6 Variable definitions**

| Variable | Value |
|---|---|
| Disabled | — |
| Enabled in Link-Monitor mode | Continuously test the connection between the BCM and remote endpoints. |
| Enabled in QoS-Monitor mode | Select this option if you want to calculate MOS values for each endpoint, determine whether the connection has fallen below a specific threshold, send MOS scores to FCAPS applications, and create a log history of the MOS scores. |

## Configuring QoS logging attributes

Configure the logging attributes to set the size and frequency of QoS logs.

### Procedure steps

| Step | Action |
|---|---|
| 1 | Click the **Administration** tab. |
| 2 | In the Navigation tree, click **System Metrics>QoS Monitor**. |
| 3 | In the Logging area, select or clear the **Enable Logging** check box. |
| 4 | In the **Maximum log file size** field, type the value of the maximum log size allowed. |



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| | |
|---|---|
| 5 | In the **Logging Frequency** field, type the value of the interval between logs.<br>After the interval you specified, the QoS system metrics appear in the Mean Opinion Scores table. |

**--End--**

**Table 7 Variable definitions**

| Variable | Value |
|---|---|
| Enable Logging | Enable the check box if you want to enable the logging of MOS scores. |
| Maximum log file size | Enter a value for the maximum size of the log file, from 1 to 10240 kilobytes (KB). The default is 10 KB. |
| Logging Frequency | Enter the time interval between each MOS log: 1 to 1440 minutes. The default is 1 minute. |

## Viewing QoS logs

The Mean Opinion Scores table displays the current network quality described as a Mean Opinion Score (MOS) for each IP destination. You can view the MOS mapping. Unlike the BCM 3.x where both transmit and receive values were reported, the QoS Monitor collects only the transmit values.

### Procedure steps

| Step | Action |
|---|---|
| 1 | Click the **Administration** tab. |
| 2 | In the Navigation tree, click **System Metrics>QoS Monitor**.<br>The QoS system metrics appear in the Mean Opinion Scores table. |
| 3 | To update the MOS table with the most current values, select **View > Refresh**, press **F5**, or select the **Refresh** icon from the toolbar. |

**--End--**

**Table 8 Variable definitions**

| Variable | Value |
|---|---|
| Name | Displays the name of the Remote Gateway. |
| IP Address | Displays the IP address of the Remote Gateway. |
| QoS Indicator | Displays a text description of the current MOS value. The MOS values can be Poor, Fair, Good or Excellent. |



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**Table 8 Variable definitions**

| Variable | Value |
|---|---|
| G.711 | Displays the current MOS value calculated when using a G.711 aLaw codec to transmit VoIP packets to this Remote Gateway.<br><br>The MOS can be a value from 0.00 to 5.00, where 0.00 is the worst score (Poor) and 5.00 is best score (Excellent). |
| G.723-5.3kbit/s | Displays the current MOS value calculated when using a G.723 5.3 kbit/s codec to transmit VoIP packets to this Remote Gateway.<br><br>The MOS can be a value from 0.00 to 5.00, where 0.00 is the worst score (Poor) and 5.00 is best score (Excellent). |
| G.723-6.3kbit/s | Displays the current MOS value calculated when using a G.723 6.3 kbit/s codec to transmit VoIP packets to this Remote Gateway.<br><br>The MOS can be a value from 0.00 to 5.00, where 0.00 is the worst score (Poor) and 5.00 is best score (Excellent). |
| G.729 | Displays the current MOS value calculated when using a G.729 codec to transmit VoIP packets to this Remote Gateway.<br><br>The MOS can be a value from 0.00 to 5.00, where 0.00 is the worst score (Poor) and 5.00 is best score (Excellent). |
| G.729A | Displays the current MOS value calculated when using a G.729A codec to transmit VoIP packets to this remote Gateway.<br><br>The MOS can be a value from 0.00 to 5.00, where 0.00 is the worst score (Poor) and 5.00 is best score (Excellent). |

## UPS metrics

BCM can support an Uninterruptible Power Supply (UPS) device to ensure continuous operation during power interruption and failure conditions. The UPS feature provides power source monitoring and battery backup so that critical system functionality required to maintain and provide warning time to either correct the problem or to activate a contingency plan for impacted services is possible. UPS is described in *Nortel Business Communication Manager 450 5.0 Installation—System* (NN40170-303) and *BCM450 5.0 Installation Checklist and Quick Start Guide* (NN40170-302) or the *BCM50 5.0 Installation Checklist and Quick Start Guide* (NN40170-308).

The UPS connects and communicates with the BCM through USB. Enable the UPS feature by plugging the UPS USB cable into the BCM USB connector before you power up the BCM. The UPS must be present during the boot up process for the BCM to function.



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The UPS Status panel tracks occurrences of alarms pertaining to UPS operation. These alarms are also sequentially viewable in the Alarm panel. The metrics correspond to alarms in the BCM and appear in the alarm panel as well.

### Accessing the UPS status

Complete this procedure to verify the status of the UPS before you boot up the BCM system.

#### Procedure steps

| Step | Action |
|---|---|
| 1 | Click the **Administration** tab. |
| 2 | In the Navigation tree, click **System Metrics >UPS Metrics > Status** tab.<br>The status of the UPS appears. The UPS Status panel confirms that a UPS is connected including model and serial number, its current status, and provides a read out of the current values. Additionally, an indication is given whether the value is within the normal range or not. |
| 3 | To check the metrics of the UPS, click the **Metrics** tab.<br>The metrics information appears in the panel. |

**--End--**

## NTP metrics

Using Network Time Protocol (NTP), you can configure the time on the BCM indirectly from a single time server. NTP is a network protocol designed to synchronize the clocks of computers over an IP network. The NTP Metrics provide an overview of the integrity of the NTP time source. If the BCM clock control has not been configured to use NTP (Configuration>System>Date & Time), then the NTP Metrics panel displays no data.



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## Accessing the NTP metrics

Complete this procedure to view NTP metrics.

### Procedure steps

| Step | Action |
|---|---|
| 1 | Click the **Administration** tab. |
| 2 | In the Navigation tree, click **System Metrics>NTP Metrics**.<br>The NTP metrics appear in the panel. |

**--End--**

**Table 9 Variable definitions**

| Variable | Value |
|---|---|
| Last Synchronized | When the last synchronization occurred. |
| Minimum time difference (s) | The minimum time change that occurred since NTP was running. |
| Maximum time difference (s) | The maximum time difference that occurred since NTP was running. |
| Last Synchronization Status | The results of the last synchronization: successful or unsuccessful. If unsuccessful the reason for the failure is given: failed to contact, or failed security check. A status of Not Running indicates that NTP is not configured. |



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# Telephony metrics monitoring

The information in this section applies to both the BCM50 and the BCM450 platforms running BCM 5.0.

You can use the Business Element Manager to view detailed information about the performance of telephony resources on the BCM 5.0 system.

The Telephony Metrics folder allows you to track different aspects of Telephony services.

This section contains information on the following topics:


- Proactive Voice Quality Management (page 41)
- Activity Reporter Basic (page 48)
- Trunk module metrics (page 50)
- Trunk module CSU statistics (page 52)
- CbC limit metrics (page 58)
- Hunt group metrics (page 60)
- PSTN Fallback metrics (page 62)


## Proactive Voice Quality Management

Use Proactive Voice Quality Management (PVQM) metrics to monitor the quality of VoIP calls. You can also use the PVQM metrics to diagnose infrastructure problems in your network.

PVQM is fully supported on Phase 2 IP sets. Phase 1 IP sets support only the following PVQM metrics: packet loss, inter arrival jitter, and rould trip delay. The following table lists the IP Phones that support PVQM.

**Table 10 PVQM set support**

| IP Set Type | Description |
|---|---|
| IP Phone 2001 | Phase 2 firmware |
| IP Phone 2002 | Phase 1 and Phase 2 firmware |




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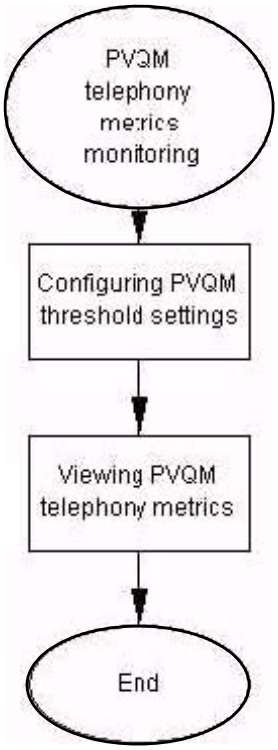
**Table 10 PVQM set support**

| IP Set Type | Description |
|---|---|
| IP Phone 2004 | Phase 1 and Phase 2 firmware |
| IP Phone 2050 v2 | PC-based soft client |
| IP Phone 2007 | Phase 2 firmware |
| IP Phone 1120E | Phase 2 firmware |
| IP Phone 1140E | Phase 2 firmware |
| IP Phone 1110 | n/a |
| IP Phones 1210, 1220, 1230 | n/a |
| IP Phones 2210, 2211, 2212 | n/a |
| IP Phones 6120,6140 | n/a |

## PVQM telephony metrics monitoring procedures

This task flow shows you the sequence of tasks you perform to configure and monitor PVQM telephony metrics on the BCM system. To link to any procedures, click on PVQM telephony metrics monitoring procedures navigation (page 43).

**Figure 3 PVQM telephony metrics monitoring procedures**



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### PVQM telephony metrics monitoring procedures navigation


- Setting the PVQM threshold settings (page 43)
- Viewing PVQM telephony metrics (page 47)


## Setting the PVQM threshold settings

You can use PVQM to configure and report threshold violations for the following voice quality metrics:

- packet loss—packets lost in transit due to errors or network failures
- inter arrival jitter—the variable delay on a packet as it traverses a network
- round trip delay
- listening R factor—the transmission quality as experienced by the user; this metric reflects the segment of the call that is carried over the RTP session

There are two thresholds for PVQM metrics: Warning, and Unacceptable. A violation of the Warning threshold indicates that the voice quality is reduced but is still within an acceptable range. A violation of the Unacceptable threshold indicates a severe degradation in voice quality.

If an alarm is generated to report a threshold violation, additional information is included in the alarm to indicate the source of the alarm and provide other troubleshooting information. Table 11PVQM Alarms (page 43) lists the abbreviations used in the alarm text to present this additional information.

**Table 11 PVQM Alarms**

| Abbreviation | Attribute | Value | Description |
|---|---|---|---|
| cT | codec type | alphanumeric | Vocoder type used on this call |
| eT | endpoint type | S or D | S indicates softclient<br>D indicates desktop |
| nLR | network loss rate | percentage, scaled by 256 (e.g. 354 = 1.4%) | Rate of network packet los |
| dR | average discard rate | percentage, scaled by 256 | Average rate of discards due to jitter |
| bD | burst loss density | percentage, scaled by 256 | Density of lost and discarded packets during burst periods |
| bL | burst length | milliseconds | Average length of bursts |
| gD | gap loss density | percentage, scaled by 256 | Density of lost and discarded packets during gap periods |
| gL | average length of gap | milliseconds | average length of gap |
| eSD | end system delay | milliseconds | Average end system delay on the call |



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**Table 11 PVQM Alarms**

| Abbreviation | Attribute | Value | Description |
|---|---|---|---|
| aNL | noise level | dBm | Measured received silent period noise level |
| aSP | average signal level | dBm | Measured received signal level during talk spurts |
| rTT | local round trip time average | 1/65536 of a second | Average round trip time on the call |

## Procedure steps

| Step | Action |
|---|---|
| 1 | Click the **Administration** tab. |
| 2 | In the Navigation tree, click **Telephony Metrics>PVQM>Threshold settings**.<br>The Proactive Voice Quality Monitoring panel appears. |
| 3 | In the **Threshold settings** table, select the metric you want to configure. |
| 4 | In the **Warning (desktop)** column, double click the value and type the threshold value you want to set. |
| 5 | In the **Unacceptable (desktop)** column, double click the value and type the threshold value you want to set. |
| 6 | In the **Warning (softclient)** column, double click the value and type the threshold value you want to set. |
| 7 | In the **Unacceptable (softclient)** column, double click the value and type the threshold value you want to set. |
| 8 | In the **Polling interval(s)** field, type the interval at which you want the metrics to be polled. |

**--End--**



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## Variable definitions

| Variable | Value |
|---|---|
| Metric | Contains the following PVQM metrics to monitor:<br>• Packet Loss Rate: The fraction of RTP data packets from the source lost since the beginning of the call, expressed as a percentage.<br>• Inter-arrival Jitter: The inter-arrival time of incoming RTP packets, as defined in RFC 1889. Expressed in milliseconds.<br>• RTCP Round Trip Delay: The round trip time of incoming RTP packets, as defined in RFC 1889. Measured in milliseconds.<br>• Listening R Factor: A scale from 0 (lowest quality) to 100 (highest quality) according to ITU-T G.107. |
| Warning (desktop) | The number of warnings you can receive for a desktop phone model. The value ranges and default thresholds are as follows:<br>• Packet Loss Rate: The value range for this metric is 0 to 100. The default value for warning thresholds is 1%.<br>• Inter-arrival Jitter: The value range for this metric is 0 to 1000. The default value for warning thresholds is 50 ms.<br>• RTCP Round Trip Delay: The value range for this metric is 0 to 1000. The default value for warning thresholds is 300 ms.<br>• Listening R Factor: The value range for this metric is 0 to 100. The default value for warning thresholds is 65. |



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| Variable | Value |
|---|---|
| Unacceptable (desktop) | The number of unacceptable errors you can receive for a desktop phone model. The value ranges and default thresholds are as follows:<br>• Packet Loss Rate: The value range for this metric is 0 to 100. The default value for unacceptable thresholds is 5%.<br>• Inter-arrival Jitter: The value range for this metric is 0 to 1000. The default value for unacceptable thresholds is 500 ms.<br>• RTCP Round Trip Delay: The value range for this metric is 0 to 1000. The default value for unacceptable thresholds is 500 ms. |
| Warning (softclient) | The number of warnings you can receive for a softclient phone model. The value ranges and default thresholds are as follows:<br>• Packet Loss Rate: The value range for this metric is 0 to 100. The default value for warning thresholds is 1%.<br>• Inter-arrival Jitter: The value range for this metric is 0 to 1000. The default value for warning thresholds is 50 ms.<br>• RTCP Round Trip Delay: The value range for this metric is 0 to 1000. The default value for warning thresholds is 300 ms.<br>• Listening R Factor: The value range for this metric is 0 to 100. The default value for warning thresholds is 65. |
| Unacceptable (softclient) | The number of unacceptable errors you can receive for a softclient phone model. The value ranges and default thresholds are as follows:<br>• Packet Loss Rate: The value range for this metric is 0 to 100. The default value for unacceptable thresholds is 5%.<br>• Inter-arrival Jitter: The value range for this metric is 0 to 1000. The default value for unacceptable thresholds is 500 ms.<br>• RTCP Round Trip Delay: The value range for this metric is 0 to 1000. The default value for unacceptable thresholds is 500 ms. |



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| Variable | Value |
|---|---|
| Polling interval(s) | The interval at which the metrics are polled. The value for this field is XXXXX. The default value is XXXXX. |

**Attention:** The term “desktop” indicates IP sets that are desktop models. The term “soft client” indicates IP sets that are software applications, such as the 2050 and the 2050MVC. Because desktop IP sets can provide better voice quality than software-based IP sets, you can specify different threshold levels for each type of IP set.

## Viewing PVQM telephony metrics

Use this procedure to view PVQM metrics.

### Procedure steps

| Step | Action |
|---|---|
| 1 | Click the **Administration** tab. |
| 2 | In the Navigation tree, click **Telephony Metrics >PVQM >Metrics**.<br>The PVQM metrics panel appears. |
| 3 | Click a column heading to sort the metrics by a particular value. |

**--End--**



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### Variable definitions

| Variable | Value |
|---|---|
| Number of connections | Displays the total number of connections by IP sets on the system since the last reset. This count includes non-interactive features such as dial tones, call progress tones, and music on hold. |
| Last rest | Displays the time of the last reset. |
| Most recent date and time | Displays the time of the most recent threshold violation. |
| Most recent DN | Displays the DN of the most recent threshold violation. |
| Count (desktop) | Displays the number of times a desktop client violated a threshold. |
| Count (softclient) | Displays the number of times a soft client violated a threshold. |
| MTBV (desktop) | Displays the mean time between threshold violations of a particular metric for desktop clients (measured in seconds). |
| MTBV (soft client) | Displays the mean time between threshold violations of a particular metric for soft clients (measured in seconds). |
| Reset metrics | Click this button to clear out the metrics table. The Last reset time displays the current date and time. |

## Activity Reporter Basic

This section contains information on the following topics:


- Enabling Activity Reporter Basic (page 48)
- Disabling Activity Reporter Basic (page 49)


### Enabling Activity Reporter Basic

Activity Reporter Basic allows you to monitor the performance of the BCM. You can use the Activity Reporter Basic to generate the following reports:

- telephone call activity
- custom call routing activity
- voice mail receive statistics
- hunt group performance

When you enable Activity Reporter Basic, the BCM automatically generates reports and updates them each night. The reports reflect the performance of the BCM during the past four days. The panel displays the date and time of the most recent report.



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### Procedure steps

| Step | Action |
|---|---|
| 1 | Select **Administration >Telephony Metrics > Activity Reporter Basic**.<br>The Activity Reporter Basic panel appears. |
| 2 | In the Activity Reporter Basic panel, select the **Enable daily data collection** checkbox to activate Activity Reporter Basic. |
| 3 | From the **Collection time** drop-down menu, select a time to generate daily reports. |

**--End--**

### Variable definitions

| Variable | Value |
|---|---|
| Enable daily data collection | Select or clear the check box to enable Activity Reporter Basic. |
| Collection Time | Set the time at which the daily reports are generated. The default time is set at 12:30 am. |
| Most recent data collection | Displays a timestamp of the time at which data was last collected. |

## Disabling Activity Reporter Basic

When you disable Activity Reporter Basic, the BCM does not generate performance reports.

### Procedure steps

| Step | Action |
|---|---|
| 1 | Select **Administration > Telephony Metrics > Activity Reporter Basic**.<br>The Activity Reporter Basic panel appears. |
| 2 | In the Activity Reporter Basic panel, clear the **Enable daily data collection** check box to deactivate Activity Reporter Basic. |

**--End--**



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### Variable definitions

| Variable | Value |
|---|---|
| Enable daily data collection | Clear the check box to disable Activity Reporter Basic. |

## Trunk module metrics

This section contains information on the following topics:


- Viewing the trunk module status (page 50)
- Viewing performance history information (page 50)
- Viewing D-channel information (page 51)
- Disabling or enabling a B-channel setting (page 51)
- Provisioning a PRI B-channel (page 52)


### Viewing the trunk module status

View the trunk module status to isolate malfunctioning parts of your BCM system. In addition, you can use the trunk module selection to disable and enable modules and devices.

### Procedure steps

| Step | Action |
|---|---|
| 1 | Select **Administration > Telephony Metrics > Trunk Module Metrics**. |
| | The window displays the locations for the modules connected to the system. |
| 2 | Select the module that you want to view. |
| 3 | Click **Start Loopback Test** to start the network test without having to remove the module. |
| 4 | Select a loopback type from the list. |
| 5 | Click **Stop Loopback Test** when done the test of the network. |

**--End--**

### Viewing performance history information

The Performance History tab displays the performance information over 15-minute intervals collected in the past 24 hours. The performance information collected includes the number of errored seconds, severely errored seconds, and unavailable seconds over each 15-minute interval.



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### Procedure steps

| Step | Action |
|---|---|
| 1 | Select **Administration > Telephony Metrics > Trunk Module Metrics**. |
| 2 | Click the **Performance History** tab to view metrics information. |

**--End--**

## Viewing D-channel information

The D-channel tab displays trunk module metrics for the D-channel.

### Prerequisites

- You must have a BRI trunk module configured on the BCM system.

### Procedure steps

| Step | Action |
|---|---|
| 1 | Select **Administration > Telephony Metrics > Trunk Module Metrics**. |
| 2 | Select the BRI module. |
| 3 | Click the **D-channel** tab to view metrics information. |

**--End--**

## Disabling or enabling a B-channel setting

If you need to isolate a problem, you can turn off individual port channels, rather than the entire module.

### Procedure steps

| Step | Action |
|---|---|
| 1 | Select **Administration > Telephony Metrics > Trunk Module Metrics**.<br>The Trunk Modules window displays the MBM location, type, state, and Loopback test. |
| 2 | Click the heading of the bus you want to view. |
| 3 | Click the tab in the lower menu marked B-channels. |



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4 Click the B-channel you want to enable or disable (B1 or B2).

5 Select **Enable** or **Disable**.

If you are disabling the channel, you are prompted by a dialog box to confirm your action. The State box indicates the mode of operation for the port. If the port is enabled, this box is blank unless a device is physically connected.

**--End--**

### Provisioning a PRI B-channel

When you purchase PRI from your service provider, you can request the number of B-channels that are allocated for you to use. For example, you can use 12 B-channels. If you do not have all of the PRI B channels, disable all the B-channels that you do not need.

#### Prerequisites

- Nortel recommends that the number of lines you deprovision on a DTM (configured as PRI) be the same as the number of B-channels that you disable. For example, if the DTM is on Expansion 1, when you disable B-channels 13 to 23, you should deprovision lines 77 to 87.

#### Procedure steps

| Step | Action |
|---|---|
| 1 | Select **Administration > Telephony Metrics > Trunk Module Metrics**. |
| 2 | Choose a module. |
| 3 | Click **B-channels**.<br>A list of the B-channels on this module appears. |
| 4 | Click a channel, for example, B 01.<br>The display shows the status of the PRI channel. |
| 5 | Click the **Enable** or **Disable** button to change the setting for the channel. |

**--End--**

## Trunk module CSU statistics

Each trunk module has an internal channel service unit (CSU). When enabled, the internal CSU monitors the quality of the received T1 signal and provides performance statistics, alarm statistics, and diagnostic information.

Trunk modules must be individually programmed to establish parameters for collecting and measuring transmission performance statistics by the CSU.



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The system accumulates three performance parameters:

- errored seconds (ES)
- severely errored seconds (SES)
- unavailable seconds (UAS)

These parameters are defined according to TIA-547A. Errored seconds are enhanced to include control slip (CS) events. Only near-end performance data is recorded.

The internal CSU continuously monitors the received signal and detects four types of transmission defects:

- any active carrier failure alarms (CFA), such as loss of signal (LOS), out of frame (OOF), alarm indication signal (AIS), and remote alarm indication (RAI)
- the number of bipolar violations that occurred in the last minute
- any defects that occurred in the last minute, such as loss of signal (LOS), out of frame (OOF), and alarm indication signal (AIS)
- the number of milliseconds of short-term alarms in the last minute, such as loss of signal (LOS), out of frame (OOF), alarm indication signal (AIS), and remote alarm indication (RAI).

A short term alarm is declared when the detected defects persist for tens of milliseconds. A carrier failure alarm (CFA) is a duration of carrier system outage.

The criteria for declaring and clearing the alarms is selectable to meet those in TIA-547A or TR64211. You can also view Carrier Failure Alarms as Core Telephony Alarms in the Alarm Viewer.

## BCM trunk module CSU statistics navigation


- Enabling the internal CSU (page 54)
- Checking the performance statistics (page 54)
- Checking the CSU alarms (page 55)
- Checking carrier failure alarms (page 55)
- Checking bipolar violations (page 56)
- Checking short-term alarms (page 57)
- Checking defects (page 57)
- Viewing CSU alarm history (page 58)




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## Enabling the internal CSU

Enable the internal CSU to gather performance statistics for your T1 lines or PRI with public interface.

### Procedure steps

| Step | Action |
|---|---|
| 1 | Select **Configuration > Resources > Telephony Resources**. |
| 2 | Select the appropriate module. |
| 3 | Click the **Trunk Module Parameters** tab. |
| 4 | In the T1 Parameters section, select the **Internal CSU** check box to enable the Internal CSU. |

**--End--**

## Checking the performance statistics

Check the performance statistics to determine if the system detects errors or alarms within the selected period.

### Procedure steps

| Step | Action |
|---|---|
| 1 | Select **Administration > Telephony Metrics > Trunk Module Metrics**. |
| 2 | Select the appropriate module. |
| 3 | Click the **Performance** tab.<br><br>The Current interval displays the duration of the current 15-minute interval of the selected card, the number of errored seconds (ES), the number of severely errored seconds (SES), and the number of unavailable time seconds (UAS). |
| 4 | Click the 24-hour summary heading for an overall summary of the previous 24 hours.<br><br>The Number of intervals, Errored Seconds, Severely Errored Seconds, Unavailable Seconds appear in the summary. |



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5 Click **Reset Statistics** to reset new settings.

The system displays a message indicating that this will remove all of the statistics.

6 Click **OK** to erase all the current statistics and begin collecting statistics again.

**--End--**

## Checking the CSU alarms

Check the CSU alarms to view the active loss of signal (LOS), out of frame (OOF), remote alarm indicator (RAI), or alarm indication signal (AIS) alarms.

### Procedure steps

| Step | Action |
|---|---|
| 1 | Select **Administration > Telephony Metrics > Trunk Module Metrics**. |
| 2 | Select a module. |
| 3 | Click the **CSU Alarms** tab.<br>The display shows all the active alarms of the types LOS (loss of signal), OOF (out of Frame), RAI (Remote alarm indicator), or AIS (Alarm indication signal). |

**--End--**

## Checking carrier failure alarms

Check carrier failure alarms to view a history of alarms for a module. CFA types reported by the BCM can be mapped to CFAs defined in TIA-547A and TR62411 as shown in the table below.

### Procedure steps

| Step | Action |
|---|---|
| 1 | Select **Administration > Telephony Metrics > Trunk Module Metrics**. |
| 2 | Select a module. |
| 3 | Click the **CSU Alarm History** tab.<br>The display shows LOS (loss of signal), OOF (out of Frame), AIS (Alarm indication signal), and RAI (Remote alarm indicator). |



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4 Select the type of alarm you want to view.

5 Select a time period.

The display shows the start time of the period.

**--End--**

## Variable definitions

**Table 12**

| Business Communications Manager | TIA-547A | TR62411 |
|---|---|---|
| LOS CFA | RED CFA | RED CFA |
| OOF CFA | RED CFA | RED CFA |
| AIS CFA | RED CFA | AIS CFA |
| RAI CFA | YELLOW CFA | YELLOW CFA |

# Checking bipolar violations

Check bipolar violations to view the number of bipolar violations occurring within the defined time period.

## Procedure steps

| Step | Action |
|---|---|
| 1 | Select **Administration > Telephony Metrics > Trunk Module Metrics**. |
| 2 | Select a module. |
| 3 | Click the **CSU Alarms** tab.<br>The display shows the number of bipolar violations that occurred in the last minute. |

**--End--**



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## Checking short-term alarms

Check short-term alarms to view the number of alarms within the last minute.

### Procedure steps

| Step | Action |
|---|---|
| 1 | Select **Administration > Telephony Metrics > Trunk Module Metrics**. |
| 2 | Select a module. |
| 3 | Click the **CSU Alarms** tab.<br>The display shows the short term alarms and the number of milliseconds (not necessarily contiguous) that were active in the last minute. |

**--End--**

## Checking defects

Check defects to view the first type of defect in the last minute.

### Procedure steps

| Step | Action |
|---|---|
| 1 | Select **Administration > Telephony Metrics > Trunk Module Metrics**. |
| 2 | Select a module. |
| 3 | Click the **CSU Alarms** tab.<br>The display shows the first type of defect and the number of milliseconds (not necessarily contiguous) the hardware reported in the last minute. |

**--End--**



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### Viewing CSU alarm history

View CSU alarm history to view all occurrences of a specific alarm.

#### Procedure steps

| Step | Action |
|---|---|
| 1 | Select **Administration > Telephony Metrics > Trunk Module Metrics**. |
| 2 | Select a module. |
| 3 | Click the **CSU Alarm History** tab.<br>The display shows all the alarms. |
| 4 | To view a specific alarm, click the alarm name.<br>The display shows all the occurrences of that alarm. |

**--End--**

## CbC limit metrics

This section contains information on the following topics:


- Accessing CbC limit metrics (page 58)
- Clearing CbC limit metrics (page 60)


### Accessing CbC limit metrics

Call-by-call service (CbC) on public PRI protocol (NI-2) allows a PBX to use channels more effectively by expanding or contracting the number of channels available to different call types such as INWATS, OUTWATS, Foreign Exchange (FX), and tie lines.

The call-by-call service is a method of offering and receiving services to Customer Premises Equipment (CPE) on ISDN PRI without the use of dedicated circuits (i.e. interface or B-channels). The Call-By-Call service conveys signaling information over an ISDN Primary Rate Interface (PRI) that indicates, on a per-call basis, the specific service type required to complete the call.

Although PRI-MCDN and IP trunks do not have multiple call types, CbC limits can be used on these trunks to limit the number of incoming or outgoing trunks that may be in use simultaneously.

When the CbC the feature is configured, use the CbC Limit metrics panel to monitor denied call activity for each service on each line pool.



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PRI lines that support call-by-call services have maximum and minimum call limits for each service. Use this panel to view reports for the services and to assess the capacity of the PRI call services on your system. These limits are set as part of the numbering plan programming.

## Procedure steps

| Step | Action |
|---|---|
| 1 | Click the **Administration** tab. |
| 2 | In the Navigation tree, click **Telephony Metrics >CbC Limit Metrics**. |
| 3 | In the **Call by CallLimit Metrics** table, select the line pool for which you want to view CbC traffic.<br>The denied call details for each type of service supported by the line pool appears in the Details for Pool table. |

**--End--**

## Variable definitions

| Variable | Value |
|---|---|
| Line Pool | The pool of lines that call-by-call limits are applied to. |
| Service Type | The type of service that the limits apply to. |
| INCOMING due to Outgoing Min. | The number of incoming calls that have been blocked due to the call-by-call limits. |
| due to Incoming Max. | The number of incoming calls that have been blocked due to call-by-call limits. |
| OUTGOING due to Incoming Min. | The number of outgoing calls that have been blocked due to the call-by-call limits. |
| due to Outgoing Max. | The number of outgoing calls that have been blocked due to the call-by-call limits. |



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### Clearing CbC limit metrics

Use this procedure to clear the Details for Pool table of the current CbC limit metrics, and start a new monitoring period.

#### Procedure steps

| Step | Action |
|---|---|
| 1 | Click the **Administration** tab. |
| 2 | In the Navigation tree, click **Telephony Metrics>CbC Limit Metrics**. |
| 3 | In the **Call by Call Metrics** table, select the line pool for which you want to view CbC traffic.<br>The denied call details for each type of service supported by the line pool appears in the Details for Pool table. |
| 4 | Select one of the calls in the **Calls denied because CbC limits were exceeded** list. |
| 5 | Click the **Reset Metrics** button. |

**--End--**

## Hunt group metrics

This section contains information on the following topics:


- Accessing Hunt Group metrics (page 60)
- Resetting the Hunt Group metrics (page 62)


### Accessing Hunt Group metrics

Hunt groups provide a service where incoming calls ring on a targeted group of telephones called a Hunt group. When you designate a Hunt group, you define the group as a unique Directory Number (DN). This DN receives and distributes calls to the telephones assigned to the group.

You can include Hunt Group hourly metrics files with the CDR data files when the are transferred to the central server. For more information on configuring this option, refer to the *Call Detail Recording System Configuration Guide* (NN40020-605).

Access the Hunt Group metrics to evaluate total call processing by hunt group member.



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## Procedure steps

| Step | Action |
|---|---|
| **1** | Click the **Administration** tab. |
| **2** | In the Navigation tree, click **Telephony Metrics>Hunt Group Metrics**.<br>The Hunt Groups table appears. |
| **3** | In the **Hunt Groups** table, select the Hunt Group for which you want to see metrics.<br>The Details for Hunt Group table appears. |

**--End--**

## Variable definitions

| Variable | Value |
|---|---|
| Hunt Group | Name of the hunt group. |
| Name | Name entered on the DN record. |
| Total calls | Total number of calls. |
| Answered: Total | Total number of answered calls. |
| Answered: Avg% | Average number of answered calls. |
| Answered: Avg time(s) | Average answer time. |
| Abandoned: Total | Total number of abandoned calls. |
| Abandoned: Avg% | Average number of abandoned calls. |
| Busy: Total | Total number of busy calls. |
| Busy: Avg% | Average number of busy calls |
| Overflow: Total | Total number of overflow calls. |
| Overflow: Avg% | Average number of overflow calls. |
| Time in Queue | Time in queue. |
| Last Reset time | Time and date format depends on the country profile of the system. |



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### Resetting the Hunt Group metrics

Use this procedure to reset the Hunt Group metrics.

#### Procedure steps

| Step | Action |
|---|---|
| 1 | Click the **Administration** tab. |
| 2 | In the Navigation tree, click **Telephony Metrics>Hunt Group Metrics**.<br>The Hunt Groups table appears. |
| 3 | In the **Hunt Groups** table, select the Hunt Group for which you want to reset the metrics.<br>The Details for Hunt Group table appears. |
| 4 | Click the **Reset** button. |

**--End--**

## PSTN Fallback metrics

This section contains information on the following topics:


- Accessing PSTN Fallback metrics (page 62)
- Resetting PSTN Fallback metrics (page 63)


### Accessing PSTN Fallback metrics

When trunks are out of service, traffic can be switched to PSTN fallback lines. Use this procedure to view how many fallback attempts and fallback failures occur within a specific period using the PSTN Fallback Metrics panel.

#### Procedure steps

| Step | Action |
|---|---|
| 1 | Click the **Administration** tab. |
| 2 | In the Navigation tree, click **Telephony Metrics>PSTN Fallback Metrics**.<br>The PSTN Fallback Metrics panel appears with the metrics displayed. |

**--End--**



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### Variable definitions

| Variable | Definition |
|---|---|
| Last reset time | The date and time the metrics table was last reset. |
| Fallback requests | The number of calls unable to route through the preferred trunk. |
| Fallback failures | The number of calls unable to route though the fallback trunk. |

## Resetting PSTN Fallback metrics

Use this procedure to clear the PSTN Fallback Metrics panel.

| Step | Action |
|---|---|
| 1 | Click the **Administration** tab. |
| 2 | In the Navigation tree, click **Telephony Metrics>PSTN Fallback Metrics**.<br>The PSTN Fallback Metrics panel appears with the metrics displayed. |
| 3 | Click the **Reset** button. |

**--End--**



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# System LEDs reference

The information in this section applies to both BCM450 and BCM50 platforms running BCM 5.0.

This section provides information about the main unit LED status during normal operation, startup, and reboot.

## Navigation

- System status monitor LEDs (page 65)

## System status monitor LEDs

The BCM system status LEDs on the main unit provide information about the status of the BCM system. Use these LEDs to determine if the system is functioning properly and if the system generates an alarm.

**Table 13 System status LEDs states and descriptions**

| Power | Status | Description |
|---|---|---|
| **Start-up sequence** | | |
| Solid yellow | Solid yellow | Power applied to the system. |
| Solid yellow | Off | Power on self test (POST); 9 seconds. |
| Solid yellow | Solid yellow | System initialization; 14 seconds. |
| Solid green | Solid yellow | Kernel initialization; 8 seconds. |
| Solid green | Flashing green | Services initialization; 1 minute. |
| Solid green | Solid green | System running; normal operation. |
| Solid green | Solid red | Services initialization failure |
| **Safe mode start-up sequence** | | |
| Solid red | Solid green | System running with manufacturing settings enabled |
| Solid red | Solid red | System running in software reset mode |
| Solid red | Flashing yellow | System running in configuration reset mode |



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**Table 13 System status LEDs states and descriptions**

| Power | Status | Description |
|---|---|---|
| **Shutdown sequence or failure** | | |
| Solid green | Flashing yellow | Graceful shutdown in progress |
| Off | Solid yellow | Graceful shutdown completed |
| Solid red | Flashing yellow | Overheating detected; thermal shutdown completed |
| Solid red | Solid red | Power spike or rail power fluctuation detected |
| Flashing red | Solid red | Rail power fluctuation; power monitor shutdown completed |
| Solid yellow | Solid red | Power spike shutdown completed |
| Off | Off | No power; system is shut down (power cable is disconnected) |
| **Start-up profile sequence** | | |
| Flashing yellow | Flashing yellow | Start-up profile executing |
| Flashing green | Flashing green | Start-up profile completed (USB device can be removed) |
| Solid green | Solid green | Start-up profile successfully applied |
| Blink yellow | Blink red | Start-up profile failure |



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# Alarm reference

For a list of alarms generated by the BCM system, see the *Nortel Business Communications Manager 5.0 Alarm Reference* (NN40170-702).



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Nortel Business Communications Manager 5.0

# Fault and Performance Management

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